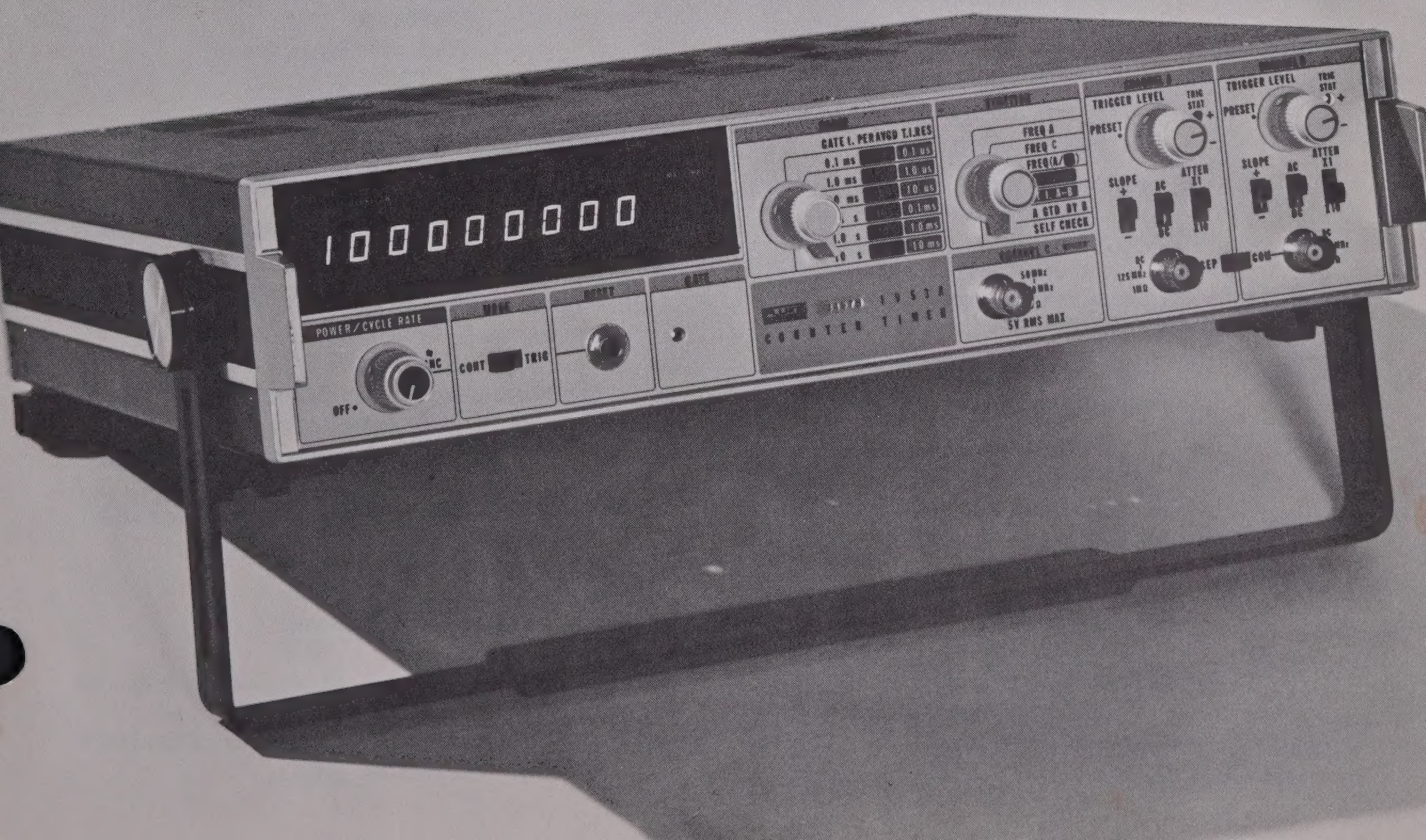
application bulletin

FLUKE

ab-31

PARALLEL REMOTE CONTROL OPTIONS FOR THE FLUKE MODEL 1953A UNIVERSAL COUNTER TIMER OPTION —11 and —12



INTRODUCTION

Options –11 and –12 are the remote control units allowing the 1953A to operate as a programmable counter within a system.

Option –11 allows full RANGE and FUNCTION selection, control of the trigger slopes A and B, and a $\overline{\text{REMOTE}}$ command (low true), which disables the manual front panel controls corresponding to these functions and places them under the control from a remote station. In addition this option provides for remote analog control of the channel A and B trigger levels. When under remote control, the 1953A always operates in a single-shot mode with the CYCLE RATE and CONT/TRIG controls being disabled. All inputs are TTL compatible, low true commands that can also be controlled by contact closure to the ground.

Option –12 is the full remote programming option and includes all the features of option –11 PLUS the remote control of the AC/DC coupling, the Attenuation Selectors, the Separate/Common input status between channels A and B and the trigger levels of channels A and B. Two internal D/A converters are included in this option for programming the trigger levels over a –1 to +1 Volt range in 10 mV resolution steps.

Option –11 can be installed in the field or the factory. Option –12 must be installed in the factory.

OPERATION

Local/Remote: A front panel control which determines the operating status of the counter/timer. When switched to the LOCAL position the counter operates in a manual manner and ignores all RCU commands.

When the LOCAL/REMOTE switch is in the REMOTE position the counter/timer responds to RCU instruction.

The following paragraphs assume that the LOCAL/REMOTE switch is in the REMOTE position.

$\overline{\text{REMOTE}}$ This RCU line is brought low to lock out the front panel controls.

REMOTE If the REMOTE line is high the counter/timer front panel controls are unlocked permitting manual operation again.

$\overline{\text{REMOTE RESET}}$ When this line is pulsed low a new measurement cycle is commenced without resetting the digital display. This means that the display still shows the original measurement result even though a new measurement is in progress.

NOTE: This same line is used on the DOU option –02.
The measurement begins on the rising edge of the pulse.

$\overline{\text{SYSTEM READY}}$ This line goes low when the counter/timer has completed it's measurement and this new result is transferred to the digital display.

$\overline{\text{EXT-T}}$ When low it allows the BCD programming of the A and B trigger level circuitry (option –12).

EXT-T If high the A and B trigger level controls can either be externally analog programmed or manually controlled with their respective front panel trigger level knobs.

RANGE (One line of 6 to be Lo)

0.1 ms	10^0	0.1 us
1 ms	10^1	1 us
10 ms	10^2	10 us
0.1 s	10^3	0.1 ms
1 s	10^4	1 ms
10 s	10^5	10 ms

FUNCTION (One line of 7 to be Lo)

FREQ A
FREQ C (prescaled input)
FREQ A/B
PERIOD A
TIME INTERVAL A to B
A GTD BY B
SELF CHECK

TRIGGER SLOPE (One line per channel)

Channel A Slope Positive (Lo) negative (Hi)
Channel B Slope positive (Lo) negative (Hi)

AC/DC COUPLING (One line per channel)

Channel A ac coupled (Lo) dc coupled (Hi)
Channel B ac coupled (Lo) dc coupled (Hi)

ATTENUATION (One line per channel)

Channel A x1 attenuation (Lo) x10 attenuation (Hi)
Channel B x1 attenuation (Lo) x10 attenuation (Hi)

Channels SEPARATE/COMMON (One Line)

Channels A, B Separate (Lo) Channel A, B Common (Hi)
The following Outputs are provided.
Power Sense (Hi) = Power On.

Overflow Status (Hi) - True
This outputs a high level when an overflow condition exists.

System Ready (Lo) - True
This signals the completion of a measurement cycle.
(NOTE: That the System Ready occurs about 3ms before the DOU ready).

Channels A and B signal outputs, TTL. These are not normally connected, except by special request. To connect these outputs, jumper both W5 and W6 on the main PCB.

CAUTION!

These outputs can be connected only in applications where the maximum channel A or B count frequency is below 25 MHz. Exposed wiring external to the unit should be kept to a minimum to prevent signal feedback.

Provision is made in option –11 for two Analog Trigger Level input/outputs which can be used for measuring the internally-generated trigger levels with an external voltmeter, or for defining the trigger levels from an external dc source. The input impedance is 20 Kilohms and the response time is 2ms. Usable range is ±1 volt, and the maximum safe level is ±5 volts. Operation with X10 attenuation extends to the apparent range to ±10V.

Although the counter will operate in a single-shot mode when under remote control, automatic measurement cycling can be established by connecting the $\overline{\text{System Ready}}$ output into the $\overline{\text{Remote Reset}}$ input. The cycle rate will be the maximum attainable with the instrument and will be equal to the gate time plus the conversion time (140us).

REMOTE CONTROL UNIT PIN ASSIGNMENTS

*A	DAC Sign A – (Lo) + (Hi)
B	Analog Trig Level A/Voltage Monitor
C	Analog Trig Level B/Voltage Monitor
*D	A BCD 1 (Hi) True
*E	A BCD 4 (Hi) True
*F	A BCD 10 (Hi) True
*H	A BCD 40 (Hi) True
*J	B BCD 1 (Hi) True
*K	B BCD 4 (Hi) True
*L	B BCD 10 (Hi) True
*M	B BCD 40 (Hi) True
*N	Inputs A, B Separate (Lo) Common (Hi)
P	A Slope + (Lo) – (Hi)
R	System Ready (Lo) True
*S	Channel B AC Coupled (Lo) DC Coupled
*T	Channel A AC Coupled (Lo) DC Coupled
U	Function PERIOD A (Lo)
V	Range 0.1s (Lo)
W	Range 1ms (Lo)
X	Function A GTD BY B (Lo)
Y	Function SELF CHECK (Lo)
Z	Range 10s (Lo)
a	Overflow Status (Hi) True
b	Function FREQ A (Lo)
c	Sense remote (Lo) True
*1	$\overline{\text{EXT-T}}$ (Lo) Enable Remote Control (Hi) Inhibit
2	DAC Sign B – (Lo) + (Hi)
3	Power Sense Status (Hi) True
*4	A BCD 2 (Hi) True
*5	A BCD 8 (Hi) True
*6	A BCD 20 (Hi) True
*7	A BCD 80 (Hi) True
*8	B BCD 2 (Hi) True
*9	B BCD 8 (Hi) True
*10	B BCD 20 (Hi) True
*11	B BCD 80 (Hi) True
12	TTL Output = to CH.A Input
13	TTL Output = to CH.B Input
14	B Slope + (Lo) – (Hi)
*15	Channel B x1 Atten (Lo) x10 Atten (Hi)
*16	Channel A x1 Atten (Lo) x10 Atten (Hi)
17	Function FREQ C (Lo)
18	TI A to B (Lo)
19	Range 0.1ms (Lo)
20	$\overline{\text{REMOTE}}$ (Lo)
21	Function FREQ A/B (Lo)
22	Range 1s (Lo)
23	$\overline{\text{REMOTE RESET}}$ (Lo)
24	Range 10ms (Lo)
25	Ground

*INCLUDED IN RCU OPTION – 12 ONLY

NOTES ON RCU CONNECTIONS TABLE

(1) Pins D through M and 4 through 11, shown in the table, represent the binary coded decimal inputs for

the trigger level controls of channels A and B. The trigger level is divided into 10 mV steps, requiring two sets of binary coded decades, one for units and one for tens. The trigger level signs are provided by pins A and 2. Pins B and C, can be used as either analog inputs for an externally applied dc trigger levels, or as output terminals for external measurement of the trigger level when that level stems from either the D/A converter or the front panel trigger level adjustments.

(2) FAN – IN REQUIREMENTS

RANGE	FAN-IN = 1
FUNCTION	FAN-IN = 1
*A, B SEP/Common	FAN-IN = 1
Channel A Slope	FAN-IN = 1
Channel B Slope	FAN-IN = 1
*Channel A AC/DC	FAN-IN = 1
*Channel B AC/DC	FAN-IN = 1
*Cahnnel A Attenuator	FAN-IN = 1
*Channel B Attenuator	FAN-IN = 1
Front Panel Lockout	FAN-IN = 5

**Option – 12 only*

(3) D/A Converters:

Resulution	= 1%
Accuracy	= ±5% of setting +2 mV.
Temperature Stability	= 200 uV/ °C

All inputs are high true

The x10 attenuator extends the apparent range to ±10V in 100 mV steps.

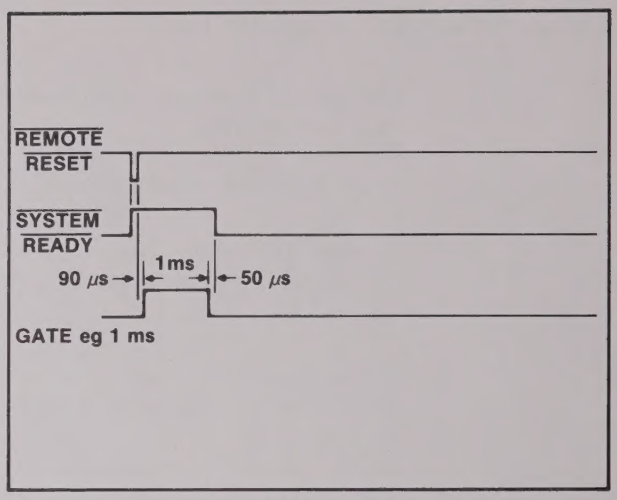


Figure 1. Single Shot Mode

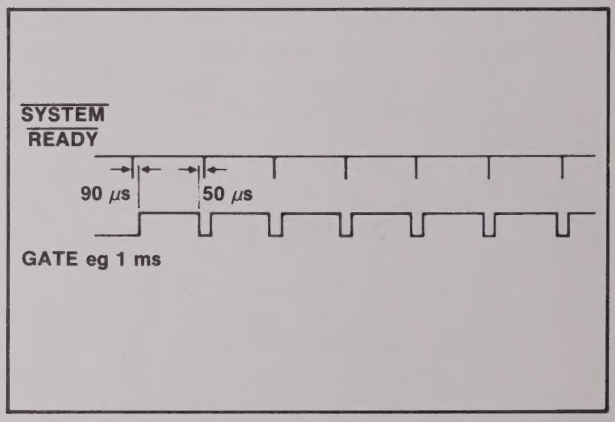


Figure 2. Automatic Measurement Cycling

MP MASTER
MA35516

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